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ABSTRACT

Phonological neutralization from a generative viewpoint is examined, and the process of solving the problems of representing the products of neutralization is described. First, in generative phonological terms, the product must be morphologically irresoluble in order to be considered a true neutralization. This distinguishes neutralization from defective distribution. Second, a dependency model of phonology is applied to English, Danish, and German examples of neutralization to solve representational problems posed in specific instances. The dependency model is seen as more amenable than standard phonological notation to the representation of relatively complex phonological segments, and therefore as useful for representing neutralization. (MSE)

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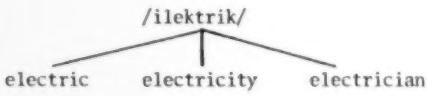
THE INTERPRETATION AND REPRESENTATION OF NEUTRALISATION IN GENERATIVE PHONOLOGY

As the title indicates the object of this paper is twofold. On the one hand, it will examine in what sense it is possible to operate with phonological neutralisation when a strictly generative position is taken. And on the other, how the problems concerning the representation of neutralisation products, which ensue from the taking of such a position, are to be solved.

Let me first, before we embark on this project, briefly recapitulate what consequences follow from adopting a generative position. Characteristic of generative phonology is that the phonological level is constructed in such a way that all forms of the same morpheme are derived from the same underlying form, as shown in (1):

(1)



This results in an abstract phonological level which is directly connected with the phonetic level by means of phonological rules. No surface phonemic contrasts are thus reflected in this type of phonology.

How do neutralisations then show up in this kind of phonology? That is, do e.g. the post-initial neutralisations such as those found in the English sp-, st-, sk-clusters or the final neutralisations found in Danish lap "patch", ladt "loaded", lak "lacquer" constitute neutralisations in a generative framework? As is well known, these examples are interpreted as instances of neutralisation in theories that operate with a surface phonemic level, cf. Davidsen-Nielsen 1978. But is this also the case in a theory which does not include a surface phonemic level such as generative phonology?

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Whether such examples of neutralisation should be considered examples of neutralisation in generative phonology depends on whether the neutralisations in question are morphologically resoluble or morphologically irresoluble. If they are resoluble then they are not instances of neutralisation. If, on the other hand, they are morphologically irresoluble then they will be considered instances of neutralisation.

The post-s stops in English sp-, st-, sk-clusters are then in generative terms instances of neutralisation. No morphological alternation will, as it were, resolve the suspension in the way that e.g. the final (surface phonemic) neutralisations in German Bund, bunt will be resolved, although they invariably are pronounced with a final [t]. The final stops of the German examples will, in generative terms, be interpreted as /d/ and /t/ respectively, i.e. no neutralisation occurs, due to alternating forms like Bunde and bunter with [d] and [t] respectively. Accordingly, by the same criterion, the Danish lap, ladt, lak examples are then also, like German Bund and bunt, resoluble in that they enter into morphological alternations, and hence in generative terms not instances of neutralisation.

The situation in generative phonology with respect to the concept of neutralisation is then clear-cut enough. The traditional (surface) phonemic neutralisations become in generative phonology either resoluble or irresoluble and only the latter will be considered 'true' neutralisations by the generative phonologists. Observe that according to this proposal neutralisation is not differentiated from non-neutralisation (defective distribution) in terms of the number of suspended dimensions, cf. Davidsen-Nielsen 1978. I find such a definition of the concept of neutralisation problematical not only because there are irresoluble neutralisations which are more than one-dimensional, cf. French vendre,[1] but also because it can be shown that what within one notational framework appears as a one-dimensional suspension may surface as a two-dimensional suspension within a different notation, cf. Anderson and Ewen 1980, Staun in preparation. In fact, it seems most appropriate that the methodological position of a theory determines, as it were, the definition of the concept, and then that that notation which seems most appropriate (in a sense which will become clear later) subsequently is applied to represent what arises as a result of the application of the theory.

Having established this, we can now turn to the other problem which this paper proposes to discuss, viz. the problem of how to represent the irresoluble neutralisation products.

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Unfortunately examples of irresoluble neutralisations in English are few. As a result the following discussion will also deal with data from other languages (despite the theme of this conference), in particular with data from Danish and German. The examples that will be subjected to an examination involve:

(2)(a)(i) English sp- st- sk-
(a)(ii) Danish -p -t -k kap 'cape'; at 'that'; ak 'alas'

(b)(i) Danish -p- -t- -k- mappe 'briefcase'; vætte(lys) 'thunderstone'; klokke 'bell'
(b)(ii) German -d und 'and'

In order to be able to focus on the representational problems that such examples pose, we must first establish the following two facts: 1) that the a)-examples involve a double encoding on the part of the native speakers and 2) that the b)-examples involve a single encoding. That is, in the a)-examples the consonants may be pronounced in two different ways, either voiced or voiceless (English, this surfaces in slips of the tongue, cf. Davidsen-Nielsen 1975) or voiceless aspirated or voiceless unaspirated (Danish) and in both languages neither the one nor the other pronunciation is predictable. On the other hand, in the b)-examples only one pronunciation invariably occurs: in Danish voiceless unaspirated, in German [t].

Now how are we to represent such phenomena? For the notation of standard generative phonology, the a)-examples pose no serious problems. In fact, they are adequately described in terms of a zero-notation, so that with respect to these we respectively get:

(3) English st- sp- sk- (C) s + [0voice] Danish -p -t -k (C) [0aspiration]

which allows for the ambiguous encoding, zero suggesting neither the one nor the other value of the binary features. The use of zeros, however, presupposes that the true generalisation condition is observed, cf. Stanley

1967, otherwise zero implies a third value, cf. (4) in which no such condition has been observed as rule (2) and matrix (a_1) highlight, and we end up with three distinct matrices (a_1), b_1), c_1).

(4) matrices a) $\begin{bmatrix}0f\\0g\end{bmatrix}$ b) $\begin{bmatrix}+f\\0g\end{bmatrix}$ c) $\begin{bmatrix}-f\\0g\end{bmatrix}$

morpheme structure rules

1)	2)	3)	4)
[ ]	[+f]	[-f]	[-g]
↓	↓	↓	↓
[-g]	[+g]	[+g]	[+f]

a_1) $\begin{bmatrix}+f\\-g\end{bmatrix}$ b_1) $\begin{bmatrix}+f\\+g\end{bmatrix}$ c_1) $\begin{bmatrix}-f\\+g\end{bmatrix}$

rule 1 + 4 rule 2 rule 3

The b) examples, on the other hand, constitute a problem for the standard notation. A zero-representation is inapplicable with these as they cannot be said to involve an ambiguous encoding. The problem which then faces the phonologist is to decide whether the neutralisation product (of such b) examples) should be identified with the one or the other member of the neutralised opposition. Given the nature of the notation in standard generative phonology, this choice will be totally ad hoc.

This fact together with the complications connected with the use of zeros inevitably leads to the question of how such a problem may be solved. As I see it, it can be overcome if we apply the phonological model known as dependency phonology, for an introduction see Anderson and Jones 1974, 1977, Anderson and Ewen forthcoming. I summarise the main differences between orthodox generative phonology and dependency phonology in figure (5). The difference between the two types of segment description pertains to the nature of the internal structure:

(5) standard matrix

$\begin{bmatrix}+f\\-f\\.\\.\\f_n\end{bmatrix}$

dependency 'matrix'

[articulatory gesture
[categorial gesture
[initiatory gesture

such that a standard matrix involves minimal structure (the features being discrete and of equal status) while a dependency 'matrix' is highly structured, in particular it is ordered in sub-segments (gestures), where each gesture is described in terms of dependency components which may enter into dependency relationships.

Given this dependency-based model, we can now show that a non-ad hoc choice is no longer involved with respect to the b)-instances. Observe, incidentally, that the representation for the Danish and German examples in (bi) and (bii) involve in dependency terms:

(6)

German	t	d	Danish	p	b
categ. gesture	C	C | V	categ. + init. gestures	C | O ∧ [ ] [ ]	O | C ∧ [ ] [ ] [ ]

from which it is immediately apparent that German /t/ is less complex than German /d/, by virtue of the fact that it involves just one component and as such should be chosen as the representation in case of neutralisation. In Danish it is less obvious that one of the stops is more simple than the other, but since governing |O| is the unexpected configuration, as it is characteristic of a tri-gestural language, which, ceteris paribus, is more complex than a bi-gestural language, the notation allows for the selection of the representation for /p/.

What remains now is to see how the representational problem posed by the post-s stops in English is solved. The opposition which is neutralised involves in dependency terms the two following configurations:

(7)

p t k	b d g
C (C;Ø)	C (C;V) | V

Given these, the intermediate status of the post-s stops is captured in

terms of:

(8) $\overset{C}{|} = \{C;\}$

which is paraphrased as |C| in governing position but where |C| is not necessarily the only component present, hence no verticals. This avoids the dubious zero-notation, at the same time as the double-encoding postulate is maintained.

It may be argued that by reserving the term neutralisation only for such suspensions which are irresoluble, we fail to allow for those resoluble examples which in the orthography show a vacillation between the two members of the neutralised pair, cf. the evidence discussed by Davidsen-Nielsen (1978:§10.10), i.e. such examples which clearly look like neutralisations. These no doubt constitute a problem to the present proposal, but it should be observed that to incorporate such examples within a generative framework requires that the model be significantly extended, in particular that an intermediate surface phonemic level between the phonological and the phonetic levels be introduced. I am not prepared to go as far as this, since what is gained by introducing such a level does not seem to outweigh the loss of generality which also follows from such an extension.

If we take a generative position and do so consistently, then the concept of neutralisation seems to crystalise: only the irresoluble instances will be considered 'true' neutralisations. To differentiate between neutralisation and defective distribution is then no longer a problem, since the concept of neutralisation is defined independently of notational properties. However, there is a notational problem which follows from the generative analysis, cf. the examples in (2b). This is not resoluble unless a notational model with a greater componentiality assumption than that of the standard notation is incorporated; in particular the model must allow for the expression of relative complexity of phonological segments. We have seen that dependency phonology, being a model of this capacity, can overcome these problems.

NOTES

1. In French vendre the nasal vowel may be interpreted as either /en/, cf. genre/generique, or / n/, cf. paysan/paysanne; that is, vendre can be argued to involve the suspension of the two dimensions [low] and [back].

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